© Entomological Society of Indochina
អ្នកជំនាញខាងជាណកសាស្ត្រឥណ្ឌូចិន
The Indochina Entomologist
OPEN ACCESS
New Taxon
ICE, 2 (10): 109–117 (2026)
ISSN (Online) 3065-1107
www.indochinaentomologist.com

https://doi.org/10.70590/ice.2026.02.10
http://zoobank.org/urn:lsid:zoobank.org:pub:09EEFDC3-2CFF-4099-AFB3-E7405AC7D9AA

First report of the genus *Machilellus* (Archaeognatha: Meinertellidae) from China, with description of a new species

Peng-Xu MU

College of Plant Protection, Fujian Agriculture and Forestry University, Fuzhou 350002, China;
https://orcid.org/0000-0003-4906-0955; mupx927@163.com

Abstract: A new species of the genus *Machilellus* Silvestri, 1911, *Machilellus hainanensis* **sp. nov.**, is described based on male and female specimens collected from Hainan Island, China. This new species is characterized by its relatively wide distance between the lateral ocelli, the more strongly pigmented maxillary palps and head capsule, the rounded ultimate article of the male labial palp, and the comparatively long third article of the hindtarsus. This study represents the first formal record of *Machilellus* in China and the second documented species of Meinertellidae from the country.

Keywords: Microcoryphia, Oriental region, rock bristletails, tropical rainforest

中国侏蛃属（石蛃目：光角蛃科）的首次报道及一新种描述

穆鹏旭

植物保护学院，福建农林大学，福州 350002，中国

摘要：基于在中国海南岛采集的雄性和雌性标本，本文描述了侏蛃属 *Machilellus* Silvestri, 1911 一新种——海南侏蛃 *Machilellus hainanensis* **sp. nov.**。该新种的主要鉴别特征包括：侧单眼间距相对较宽，下颚须与头壳着色更为显著，雄性下唇须末节呈圆形，以及后跗节第三节相对较长。本研究首次正式记录了侏蛃属在中国的分布，并成为中国光角蛃科第二个有文献记载的物种。

关键词：石蛃目，东洋区，光角蛃，热带雨林

Citation: Mu P-X 2026: First report of the genus *Machilellus* (Archaeognatha: Meinertellidae) from China, with description of a new species. *The Indochina Entomologist*, 2 (10): 109–117. [穆鹏旭 2026: 中国侏蛃属（石蛃目：光角蛃科）的首次报道及一新种描述. 中南半岛昆虫学家, 2 (10): 109–117.]
https://doi.org/10.70590/ice.2026.02.10

Accepted by Cheng-Bin WANG: 22.II.2026; published online: 8.III.2026

Copyright Peng-Xu MU. This is an open access article distributed under the terms of the Creative Commons Attribution License (CCBY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

The genus *Machilellus* was established by Silvestri (1911) based on *Machilellus orientalis* Silvestri, 1911, described from a female specimen collected in West Java. Wygodzinsky (1953) later reported this species from Sumba Island. Sturm & Bach de Roca (1988) provided a more detailed redescription of *M. orientalis* based on the holotype and an additional female specimen from Krakatau, and suggested that Wygodzinsky's record from Sumba Island likely represents a different species due to its distinct pigmentation and the greater distance between the lateral ocelli. Sturm & Smith (1993) further expanded the known distribution of *M. orientalis* to Queensland, Australia, although the male of the species remains unknown.

A second valid species, *M. heteropalpus* Mendes 1981, was described from central Vietnam based on both sexes. It can be distinguished from *M. orientalis* by the pigmentation of the maxillary palp and by having fewer ventral setae on the legs (Mendes 1981). As currently understood, the genus *Machilellus* is mainly characterized by the absence of a process on article II of the maxillary palp, the absence of coxal styli on all legs, the three-segmented tarsi, and the relatively well-developed sternites II–III (Mendes 1981; Mendes *et al*. 2009).

Prior to the present study, only one species of Meinertellidae had been formally recorded from China: *Machilontus* (s. str.) *medogensis* Song & Huang, 2011, from Medog, southeastern Xizang (Song *et al*. 2011). Here, I describe a new *Machilellus* species from Hainan Island, southern China, which is the first report of this genus and also the second known member of Meinertellidae in China.

Material and methods

The specimens used in the present study were preserved in 95% ethanol and deposited in the State Key Laboratory of Agricultural and Forestry Biosecurity, College of Plant Protection, Fujian Agriculture and Forestry University (**FAFU**).

Specimens were examined using a Nikon SMZ18 stereomicroscope. Microphotographs were captured with a computer-connected Nikon imaging system comprising a Nikon Eclipse Ci-L upright microscope, a Nikon 16 MP digital camera with a 0.55× adapter, and NIS-Elements D software (version 4.60.00). In situ photographs were captured using a Sony Alpha 7R III digital camera equipped with a Sigma 70 mm macro lens. All images were processed using Adobe Photoshop 2023. The subdivision of the ovipositors follows Sturm & Bach de Roca (1993).

Taxonomy

Genus *Machilellus* Silvestri, 1911

Machilellus Silvestri, 1911: 93, Fig. XV. **Type species:** *Machilellus orientalis* Silvestri, 1911, by monotypy.

Included species: *Machilellus orientalis* Silvestri, 1911 [only known from the female; Indonesia: West Java]; *M. heteropalpus* Mendes, 1981 [known from both sexes; Vietnam]; *M. hainanensis* **sp. nov.** [known from both sexes; China: Hainan].

Diagnosis. (1) Article II of maxillary palp without a process; (2) modified strong bristles present on inner faces of articles II–III of maxillary palp in males (dense on article II, fewer on article III), absent in females; (3) styli absent on all legs; (4) each tarsus with three articles, devoid of scopulae; (5) 1+1 eversible vesicles present on coxosternite I–VII; (6) sternites II–III relatively well developed; (7) ovipositor of tertiary type, long and slender, pattern of macrochaetae on distal articles of gonapophyses similar.

Remarks. The specimen identified as *Machilellus orientalis* and illustrated by Sturm & Bach de Roca (1988) from Krakatau is likely attributable to a different species. In comparison with the original figures by Silvestri (1911) and the redrawn figures provided by Sturm & Bach de Roca (1988), the Krakatau specimen shows a hindtarsus with a distinctly longer third article than that of true *M. orientalis*.

FIGURES 1–3. *Machilellus hainanensis* **sp. nov.**: **1–3** habitus in life.

Furthermore, the record of "*Machilellus orientalis*" from Queensland reported by Sturm & Smith (1993) also probably represents a different species, given the great distance from the type locality and the markedly larger body size compared with the Java specimen (8.2 mm vs 5 mm).

Distribution. Probably widespread across Indochina and the Sunda Islands, with its range extending eastward into Melanesia and northeastern Australia, and northward into tropical southern China.

Machilellus hainanensis sp. nov. 海南侏蛎

https://zoobank.org/0DA7B788-B306-4576-9248-1DC95D95CF06

Figs 1–27

Type-material. ***Holotype*:** ♂**,** CHINA, Hainan Province, Baoting Li and Miao Autonomous County, Mount Qixian Hot Springs National Forest Park (18.702040N, 109.691319E, alt. 266 m) [WGS84], 14.XII.2025, leg. P.-X. Mu; in ethanol; FAFU. ***Paratype*:** 1♂ 3♀, same data as holotype; in ethanol; FAFU.

Description. Body length: ♂ 6.75–7.91 mm, ♀ 7.54–8.92 mm; antennae and caudal filaments incomplete in all specimens; complete antennae length 1.5–1.7 times body length, complete paracercum length 1.6–1.7 times body length, according to a rough estimate based on in situ photos (Figs 1–2). Color pattern of scales as in Figs 1–3.

Scape luminous yellow, with two small brownish red spots on outer surface and two larger brownish red spots on inner surface; pedicel luminous yellow, with one brownish red spot on inner surface; flagellum light brown. Length/width ratio of scape 1.44–1.76; scape 3.71–4.11 times longer than pedicel (Fig. 6).

Compound eyes yellowish with dark brownish red marking internally, medium size, relatively flat, with ratios of length to width 0.93–0.99, line contact to length 0.46–0.49. Lateral ocelli dark brownish red with white borders, sole-shaped, with ratios of length to width 0.38–0.40, and with width reaching 0.90–0.91 of eye width. Ratio of distance between inner margins of lateral ocelli to combined width of compound eyes 0.17–0.18 (Figs 4–5).

Frons with two pairs of dark brownish red spots between lateral ocelli, and with one V-shaped marking between median ocellus and lateral ocelli, each arm of V-figure connected with one spot close to base of antenna. Clypeus mostly pale, with inconspicuous brown pigmentation on whole surface (Figs 4–5).

Mandible with four distinct teeth in incisor portion (Fig. 7).

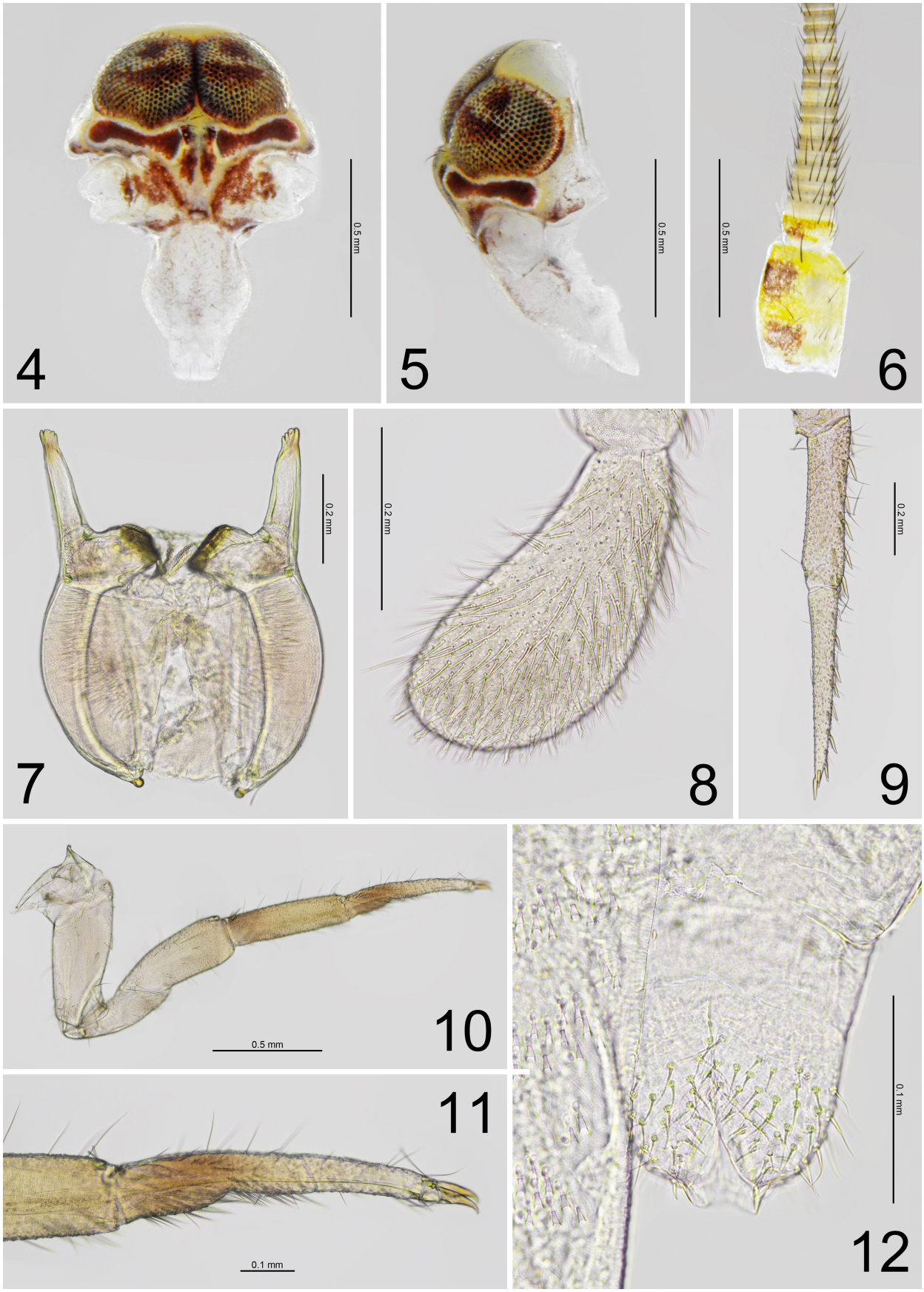
Article I of maxillary palp with well developed outer apophysis, two inner apophyses poorly developed with blunt apices; article II without apophysis, dense modified strong bristles present on inner face in male but absent in female (Figs 14–15); article III with fewer modified bristles on inner-ventral region in male (absent in female); articles V, VI and VII with 1, 14 and 17 hyaline spine-like setae in dorsal margins respectively in holotype (Fig. 9). Length ratio of articles VII:VI:V:IV:III = 1.00:0.82:0.92:0.64:0.66 in holotype. Distribution of pigmentation on outer surface as in Fig. 13 and on inner surface as in Fig. 14.

Distolateral corners of submentum blunt in male and acuter in female (Figs 16–17). Article III of labial palp slightly longer than article II, rounded clavate in male and more slender in female; apical region with 58 sensorial cones in holotype, and each cone with 3–6 (4 for majority) apical processes (Fig. 8). Distribution of pigmentation as in Figs 16–17.

Pronotum with wavy anteromedian margin well fitted against upper edges of compound eyes (Fig. 3). Mesothorax strongly humped. Lateral parts of meso- and metanotum well developed.

Styli absent in all coxae. Foreleg slightly thicker than mid- and hindleg; hindtibia slender, length/width ratio of each tibia in holotype as follows: 1.94 in foretibia, 1.98 in midtibia and 3.30 in hindtibia. All tarsi devoid of scopulae (Figs 10–11). Distribution of pigmentation on outer surfaces of all legs as in Figs 18–20.

Coxosternites I–VII with 1+1 eversible vesicles, coxosternites II–IX with pair of styli (Figs 21–27). Posterolateral parts of coxosternite II rounded, strongly expanded posteriorly, and degree of expansion gradually decreased in subsequent coxosternites. Sternites II–III relatively well developed. Length ratio of styli (excluding



FIGURES 4–12. *Machilellus hainanensis* **sp. nov.**, male: **4** head capsule, frontal view **5** head capsule, lateral view **6** basal part of antenna, inner view **7** mandibles **8** ultimate article of labial palp **9** articles VI–VII of maxillary palp **10** hindleg **11** hindtarsus **12** penis.

FIGURES 13–20. *Machilellus hainanensis* **sp. nov.**: **13** maxilla of male, outer view **14** maxilla of male, inner view **15** maxillary palp of female, inner view **16** labium of male **17** labium of female **18** foreleg of male **19** midleg of male **20** hindleg of male.

FIGURES 21–27. *Machilellus hainanensis* **sp. nov.**: **21** coxosternite II of male **22** coxosternite IV of male (styli missing) **23** coxosternite VI of male (styli missing) **24** coxosternite VIII of male **25** coxosternite IX and penis of male **26** coxosternite VIII and anterior gonapophysis of female **27** coxosternite IX and posterior gonapophyses of female.

terminal spines) to corresponding coxites as follows: 0.51–0.53 for coxosternites II–III, 0.60–0.63 for coxosternite VII, 0.60 for coxosternite VIII in male, 0.67 for coxosternite VIII in female, 0.72 for coxosternite IX in male, and 0.61 for coxosternite IX in female. Length ratio of terminal spines to corresponding styli as follows: 0.73 for styli VIII in male, 0.59 for styli VIII in female, 0.51 for styli IX in male, and 0.39 for styli IX in female.

Penis small, with numerous simple setae around opening (Figs 12, 25).

Ovipositor of tertiary type, slender, without fossorial claws, surpassing apices of styli IX (excluding terminal spines); anterior and posterior gonapophyses with 65–66 and 60–63 articles, respectively; number of basal bare articles more than half of the total; apical spines shorter than three distal articles altogether (Figs 26–27).

Diagnosis. Compared with *Machilellus orientalis* from Java (based on the original description and illustrations of Silvestri 1911), *M. hainanensis* **sp. nov.** has a greater distance between the inner margins of the lateral ocelli, slenderer and more elongated maxillary and labial palps, different pigmentation of maxillary palp, and a longer ultimate tarsal article of the hindleg.

In comparison with *M. heteropalpus* from Vietnam (Mendes 1981), *M. hainanensis* **sp. nov.** exhibits a more strongly pigmented maxillary palp, bearing dark rings on articles IV–V, as well as a more pigmented head capsule, relatively shorter terminal spines of styli VIII–IX, and a more rounded ultimate article of the labial palp in the male.

Habitat. All specimens were collected from rock surfaces adjacent to a small stream.

Etymology. This new species is named after Hainan Island, where the type locality is situated.

Distribution. China: Hainan Island (Mt. Qixian).

Acknowledgements

I extend my sincere gratitude to Dr. Graeme B. Smith (Australian Museum, Sydney, Australia) for providing important literature. I am deeply grateful to the reviewer for providing detailed and constructive feedback.

References

Mendes LF 1981: Sur quelques Microcoryphia de l'Asie Orientale: notes et descriptions (Insecta; Apterygota). *Nouvelle Revue d' Entomologie*, 11: 15–28.

Mendes LF, Gaju-Ricart M, Molero-Baltanás R & Bach de Roca C 2009: On the genera *Allomachilis* Silvestri, 1906, and *Kuschelochilis* Wygodzinsky, 1951 (Insecta: Microcoryphia). *Pesquisa agropecuária brasileira, Brasília*, 44 (8): 984–987.

Silvestri F 1911: Materiali per lo studio dei Tisanuri. XIII. Nuove specie di Machilidae della regione indo-malese. *Bolletino del Laboratorio di Zoologia generale e agraria di Portici*, 5: 88–95.

Song ZS, Huang FS & Liang AP 2011: *Machilontus* (s. str.) *medogensis* Song & Huang sp. nov. from Tibet, the northernmost record of the genus *Machilontus* Silvestri, 1912 and the first record of the family Meinertellidae (Insecta: Microcoryphia: Machiloidea) in China. *Zootaxa*, 2822: 61–68.
https://doi.org/10.11646/zootaxa.2822.1.4

Sturm H & Bach de Roca C 1988: Archaeognatha (Insecta) from the Krakatau Islands and the Sunda Strait area, Indonesia. *Memoirs Museum of Victoria*, 49: 367–383.

Sturm H & Bach de Roca C 1993: On the systematics of the Archaeognatha (Insecta). *Entomologia Generalis*, 18: 55–90.

Sturm H & Smith GB 1993: New bristle tails (Archaeognatha: Meinertellidae) from Australia. *Journal of the Australian Entomological Society*, 32: 233–240.
https://doi.org/10.1111/j.1440-6055.1993.tb00580.x

Wygodzinsky P 1953: Uber einige Machiliden aus Indonesien (Thysanura, Insecta). *Verhandlungen der Naturforschenden Gesllschaft in Basel*, 5: 347–355.

Additional information

Author contributions: The author solely contributed to this work.

Conflict of interest: The author has declared that no competing interests exist.

Data availability: All of the data that support the findings of this study are available in the main text.

Ethical statement: No ethical statement was reported.

Funding: This study was self-funded by the author.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of *ICE* and/or the editor(s). *ICE* and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

Photo Gallery

东方短丝蜉 *Siphlonurus orientalis* Qiang & Zhou, 2025
Xianyou, Fujian
photograph by Peng-Xu MU [穆鹏旭]